

In the Specification:

Please replace the paragraph beginning on page 1, line 1 with the following amended paragraph:

The present invention relates to a magnetic film for a magnetic head, more precisely relates to a magnetic film for a write-head of a magnetic head, ~~especially~~ especially a perpendicular recording head, which is capable of intensifying a writing magnetic field, improving magnetic response and raising recording density.

Please replace the paragraph beginning on page 1, line 15 with the following amended paragraph:

On the other hand, a NiFe single layer film, whose saturation magnetic flux density (Bs) is 1-1.5T, has been used as a conventional material of a write-head. Thickness of the film is several  $\mu\text{m}$ , namely the film is a thick one. In the future, a data transfer rate of a magnetic disk drive unit will be accelerated. Eddy current loss occurs in the thick magnetic film, ~~so that a~~ that writing performance of the write-head is made worse. To solve the problem, a multilayered film, in which magnetic layers and insulating layers are alternately piled, has been studied. In the multilayered film, resistance of the insulating layers and the magnetic ~~layers are~~ layers is high, ~~and thickness~~ and the thickness of the film is less than skin depth, e.g., submicron, so that eddy current loss can be restricted.

Please replace the paragraph beginning on page 1, line 25 with the following amended paragraph:

To make magnetic anisotropy small and gain enough soft magnetism, amorphous, micro crystals and granular magnetic films have been studied as the magnetic layer. Further, by employing the multilayered structure, the magnetic layers are statically magnetic-connected, so that a magnetic circuit is closed and frequency response can be improved. According to J.Magn. Soc. Jpn. vol. 14, p. 379 (1990) and J.Magn. Soc. Jpn. vol. 15, p. 391 (1991), an amorphous metal CoNbZr and a micro crystal FeSiN are used as materials of the magnetic layers. Saturation magnetic flux density of the magnetic ~~layers are~~ layers is 0.8-1.85T. However, recording density will be ~~further~~ even higher, so a track width and a pole length of a front end section of a magnetic pole must be smaller so as to write smaller bits.

Please replace the paragraph beginning on page 2, line 10 with the following amended paragraph:

Further, coercivity of recording media will be increased so as to limit thermal decay of magnetization of magnetic minute particles. Magnetic materials must have high saturation magnetic flux density ( $B_s$ ) to generate a higher magnetic field for writing data. Therefore, enough magnetic fields cannot be generated with amorphous and microcrystal materials, whose  $B_s$  is 0.8-1.85T. An FeCo alloy is a thermal equilibrium alloy having

maximum  $B_s$  of 2.45T, but its magnetostriction constant ( $\lambda$ ) is large, e.g.,  $30\text{--}70 \times 10^{-6}$ , so a ~~inverse~~ so an inverse magnetostrictive effect, which is caused by isotropic stress generated while a layer is formed, cannot be ignored. Therefore, it is very difficult for the FeCo single layer to have soft magnetism with uniaxial magnetic anisotropy. In the case of using a magnetic material having isotropic magnetic characteristics as magnetic poles, data recorded on a recording media are apt to be erased by a leaked magnetic field corresponding to a residual magnetization ( $B_r$ ).

Please replace the paragraph beginning on page 4, line 8 with the following amended paragraph:

To solve the problem of erasing data by the magnetic field leaked from a magnetic pole, there are several ways, for example: giving uniaxial magnetic anisotropy to a magnetic layer; closing a magnetic circuit by a multilayered film, in which a magnetic layer and a nonmagnetic layer are static-magnetically coupled; and accelerating antiparallel magnetization sequence between magnetic layers by exchange coupling so as to increase a saturated magnetic field ( $H_s$ ). Therefore, materials, which ~~restrains~~ restrain residual stress in layers, ~~gives~~ gives uniaxial magnetic anisotropy to nonmagnetic layers (a underlayer and/or an intermediate layer), ~~eloses~~ close a magnetic circuit between magnetic layers and ~~generates~~ generate antiferromagnetic coupling between magnetic layers, are required. Further, if a surface of an FeCo layer is rough, a nonmagnetic layer cannot magnetically insulate FeCo

layers, so that the magnetic circuit between the magnetic layers cannot be closed and the antiferromagnetic coupling disappears. Therefore, the roughness must be controlled.

Please replace the paragraph beginning on page 6, line 8 with the following amended paragraph:

In the magnetic film, the magnetic film may have uniaxial magnetic anisotropy having a easy axis of magnetization and a hard axis of magnetization, a ~~coercivity~~ coercivity of the hard axis of magnetization may be 0.8 kA/m or less, and residual magnetization ratio of the hard axis of magnetization ( $B_{rh}/B_{sh}$ ) may be 30 % or less.

Please replace the paragraph beginning on page 10, line 12 with the following amended paragraph:

Fig. 3 is a graph showing residual stress  $\sigma$  with respect to the sputtering pressure for forming the  $\text{Fe}_{70}\text{Co}_{30}$  layer of the multilayered film including the Ru underlayer (0.75 nm) and the  $\text{Fe}_{70}\text{Co}_{30}$  layer (100 nm). The residual stress  $\sigma$  was estimated from differences between lattice constants calculated by X-ray diffraction and lattice constants of Bulk. Further, the residual stress was estimated from differences between amount of warping the substrate before forming the layer and that after forming the layer. The results were almost equal. In Fig. 3, ~~minus~~ minus values indicate compressive stress; plus values indicate tensile stress. The residual stress was linearly changed from the compressive stress to the

tensile stress with increasing the pressure for forming the  $\text{Fe}_{70}\text{Co}_{30}$  layer. Preferable magnetic characteristics were observed in a low residual stress range:  $\pm 0.5$  GPa.